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ABSTRACT

A study of the high school experiences and performance of Asian Americans found them to be performing well in school, with average test scores in math and science as high as those of White students. The data showed the Asian Americans to be more committed to academic excellence. Compared to other students, they took more academic courses, spent more time on homework, and were less likely to be absent or late for school. It is possible that Asian American students have higher educational aspirations as a result of parental expectations and pressures, and therefore set their goals early. However, recent immigrants had much lower scores than white students in verbal skills and this could hamper them from progressing in certain careers. Thus, programs must be developed to improve the verbal skills of Asian American students in general and of recent immigrants in particular. An important finding is that while family background is a major factor in student achievement, it is not more important than school experiences in determining student learning. (RDN)

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School Experiences and Performance of Asian American High School Students

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School Experiences and Performance of Asian American High School Students

I. Background and Purpose

Over the past few years, there have been frequent reports about Asian American students' high achievement in schools. There were reports about recent Asian immigrants who overcame economic and language handicaps and became outstanding students in a short period of time. There were reports about a higher proportion of Asian American students among the winners in various academic achievement competitions such as Merit Scholarships and Westinghouse Science Talent Search. There were reports about a higher enrollment of Asian American students in the fields of science and engineering. Furthermore, in State and local educational assessments, Asian students frequently scored higher than other students, particularly in the areas of mathematics and science (Frechtling, et al., 1983).

While these reports may well be factually correct, they may not accurately describe the general status of Asian American students as a whole. They may be exceptional instances that are limited to specific localities or to special self-selected groups of students. An overall assessment of the achivement of Asian American students should be based on national data collected from all or a representative sample of such students. Unfortunately, over the years, data on Asian American students have generally been scarce, and very few studies of such students have a

national perspective.

A recent study entitled High School and Beyond (HS&B) provides an opportunity to fill the information gap. HS&B is a national longitudinal study sponsored by the National Center for Education Statistics within the Office of Educational Research and Improvement, the U. S. Department of Education. HS&B involved a national probability sample of sophomores and seniors of 1980 from 1,015 high schools across the nation. In addition to cognitive test scores, the survey collected information on the students' family background, attitudes and values, school experiences and coursework in four years of high school. The base-year data collection took place in spring 1980, and the first follow-up survey in spring 1982. The second follow-up began in February 1984 and will be completed early this summer.

Among the sophomores selected for the HS&B survey, there are about 400 Asian American students. Within this subgroup, about 56 percent are from the West, 15 percent from the Northeast, 16 percent from the South, and 13 percent from the North-Central region of this country. (The percentage distribution is comparable to Census data.) Data collected from these students, together with data from other groups of students employed for comparative purposes, formed the basis for this analysis. Further details about the sample and the data base are presented in Appendix A of this paper.

It is , therefore, the primary purpose of this study to examine

the school experiences and performance of Asian American high school students on the basis of HS&B data. Specifically, the following questions are posed for this study:

1. How well do Asian American students perform in school? Do they score higher on achievement tests than other students?
2. If so, what are the major factors which might explain their high achievement?
3. What are the unmet needs of Asian American students? What kind of educational services, if any, are most needed by these students?

Answers to these questions should help to protray Asian American students as a whole, and might suggest ways for improving their academic performance.

II. Analysis Strategies

To answer the above questions, two types of analyses were carried out. The first, which is descriptive in nature, examines various racial/ethnic groups with respect to curricular experiences, time on tasks, study habits, parental press, and cognitive test scores. The second analysis uses multiple regression techniques to determine the relationships between achievement (as measured by cognitive test scores) and those variables identified in the descriptive analysis. In the regression analyses, family background is used as a control variable because the primary goal of the study is to identify relationships that apply to all

students regardless of family background.

Many researchers have argued that Asian American students have such diverse backgrounds that they should not be treated as a single group. For this reason, consideration was given to the idea of examining various Asian subgroups such as Chinese, Koreans, Japanese, and South Pacific Islanders. Unfortunately, sample sizes were not large enough to provide reliable estimates for these subgroups. A cursory examination of subgroup differences, however, suggested that they are not large and are possibly attributable to variations in length of residence in this country. Length of residence was therefore used as a classification variable in this analysis.

All estimates in this analysis were properly weighted to reflect population values. Tests of statistical significance were applied to all group comparisons. Instructions for computation of standard errors of percentages are given in Appendix A. All group differences cited in this report are significant at the .05 level unless indicated otherwise.

III. Results

A. Descriptive Analysis

How well do Asian American students perform in school? On the basis of cognitive tests administered in the 10th and 12th grade, Asian American students scored lower than whites in verbal skills

but performed as well as whites in mathematics and science. Like white students, Asian students outperformed other minority students in all tests. This finding is consistent with those reported by Hsia (1981), and by Okada (1984). It is interesting to note that immigrants who had been in this country less than 6 years performed well on the mathematics and science tests in spite of their lack of proficiency in English.

Asian American students differed from other students in a number of aspects of their school experience. They were more likely to enroll in college preparatory (academic) programs than other students. They took more courses in foreign languages, high-level mathematics, and science. They generally spent more time on homework, and less time working for pay. Furthermore, they were less likely to be absent from school and they had higher educational aspirations. Details are discussed below:

1. Cognitive test scores in the 10th and 12th grades

The battery of tests which was administered to the students both in the 10th and the 12th grade included tests of vocabulary, reading, writing, mathematics, and science. The first three tests were combined for purposes of this analysis, and are referred to as the verbal skills test. Tests were scored using a formula which corrects for guessing. The average scores on these cognitive tests by different racial/ethnic groups are presented in table 1.

On the verbal skills test, both at the 10th and the 12th grade levels, Asian American students scored lower than whites but higher than each of the other groups. In mathematics, Asian American students scored higher than white students, but the differences were not statistically significant. In science, white students made the highest scores but these were not significantly higher than the scores of Asian American students. In both mathematics and science, Asian and white students scored higher than other minority groups.

A concern of many educators is that students who recently immigrated to this country (less than 6 years) may not do well in school. In general, this concern is substantiated by the data. As shown in table 2, Asian American who had been in this country less than 6 years scored lower on all tests than did those students who had lived in this country all or most of their lives. The differences, as expected, were particularly large in verbal skills. However, it should be noted that those students still scored high on mathematics and science tests and their average score in verbal skills was as high as, if not higher than, the average scores of other minority students.

2. Cognitive growth rates

One informative measure of student performance is the change or growth over a period of time. Real change, however, is difficult to measure. For example, the simple difference between 10th and 12 grade scores may not be the best measure of growth because the

learning function is probably not linear (i.e., it does not grow at a constant rate), and because the tests may have psychometric problems involving primarily test reliability and floor and ceiling effects. In a study by Carroll (1984), it was shown that residual gain scores and the percent of new learning (i.e., percent of items incorrectly answered or missed in the pretest but correctly answered in the post test) are reasonable measures of growth. In this analysis, the latter measure was chosen for its conceptual simplicity.

The results show that on each of the three tests Asian and white students had rather similar growth indices. As shown in table 3, the growth rates were around 47 percent in verbal skills, 44 percent in mathematics, and 40 percent in science for both Asian and white students.

Both white and Asian students showed significantly higher growth than other racial/ethnic groups of students in all areas.

The recent Asian immigrants (less than 6 years) had a slower growth than other Asian students in verbal skills, but had about the same growth rate in mathematics and science (see table 4). The slow growth rate in verbal skills suggests that recent immigrants may need extra assistance in this area.

3. <u>High school experience</u>

The amount of cognitive growth that takes place in high school is

undoubtedly related to the quality and quantity of high school experience. However, it is difficult to identify the relevant experiences and measure them objectively. In this analysis, the focus is on those experiences about which students have a choice and for which HS&B has provided some information. These include the kind of high school program, the number and kind of courses taken, and extra-curricular activities. These are some of the key variables that researchers have found to be related to school achievement (Welch et al., 1982; Jones, 1983).

As shown in table 5, Asian American students were more likely than other groups of students to enroll in academic (college preparatory) programs -- 47 percent of Asian American students as compared to 37 percent of white, 29 percent of black, 23 percent of Hispanic, and 23 percent of American Indian students.

The kind of program in which students enroll strongly influences the coursework taken in high school. Thus, it is expected that there would be a high percentage of Asian students taking academically-oriented courses since a high percentage of Asian students were enrolled in academic programs. As shown in table 6, Asian American students earned more total credits in high school than did other groups of students. They also earned more credits in academic-oriented courses (e.g., English, mathematics, science, social studies, foreign language, and computer science). Table 6 also shows that while other groups of students took a lighter workload in the 11th and the 12th grade than in earlier

grades, Asian American students maintained a heavier course load over the entire four years of high school.

A further examination of course taking patterns reveals that Asian American students took more courses in science and mathematics, particularly in high-level courses such as chemistry II, physics, trigonometry, and calculus. As shown in table 7, Asian students earned about three times as many credits in higher level mathematics and science courses as other minority students, and at least 50 percent more credits than whites.

Asian American students were also more likely to take a foreign language. Of those 1980 sophomores who graduated in 1982, 69 percent of Asian American students took at least one foreign language, as compared to 49 percent of white, 38 percent of Hispanic, and 37 percent of black students. About 19 percent of Asian American students took more than one foreign language compared to only 6 percent of white students (table 8).

In addition to coursework taken in high school, participation in extra-curricular activities may also affect students' academic performance and development in leadership and other social skills. As shown in table 9, Asian American students were more likely than other students to have participated in honorary clubs, subject-matter clubs, and student council or government, but less likely to have participated in vocational education clubs, community youth organizations, and church activities. Asian American students were also less likely to participate in atheletic teams.

4. Individual commitment and aspirations

The student's own commitment to achieving excellence in education is an important factor in achievement. Asian American students to various degrees show comparatively more personal commitment.

As shown in table 10, Asian American students spent more time on homework than other students. About 46 percent of Asian American students spent 5 or more hours per week on homework in the sophomore year as compared to 29 percent of white, 25 percent of black, and 18 percent of Hispanic students. On the other hand, Asian American students spent less time working for pay during school. Only about 24 percent of Asian American students worked 15 or more hours per week, as compared to 32 percent of white, 30 percent of black, and 36 percent of Hispanic students (table 11).

Asian American students were less likely than other students to be absent from school. About 45 percent of Asian American students, as compared to 26 percent of whites, reported that during the fall semester 1980 they were never absent from school for reasons other than illness (table 12).

Furthermore, Asian American students had higher educational aspirations than other students. In the sophomore year, about 35 percent of Asian American students expected to receive a graduate school or professional school education, as compared to 18 percent of whites, 20 percent of blacks, and 14 percent of Hispanics. Another 30 percent of Asian American students expected

to obtain a four-year college degree. Only 13 percent of Asian American students (vs. 25 percent of whites) did not expect to receive some education beyond high school (table 13).

5. Parental press and assistance

Various studies have shown that family background is highly related to student achievement (Coleman et al., 1966; Averch et al., 1972). In general, students from higher socioeconomic backgrounds (SES) tend to have higher achievement than students of lower SES. As shown in table 14, Asian and white students were similar in socioeconomic status.

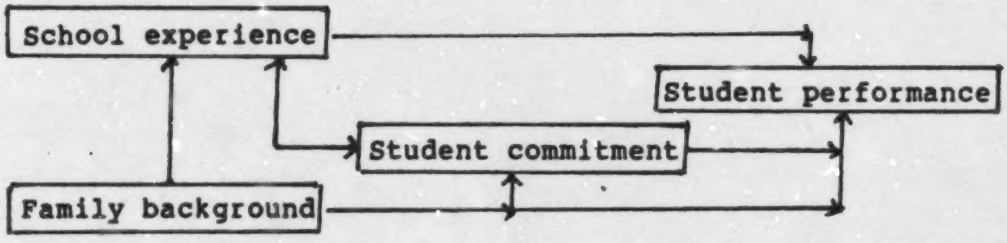
Many researchers have argued that it is not what the family is but what the family does that affects student learning. One relevant variables that was used in this analysis was whether or not parents monitored their child's school work. The results show that with respect to monitoring of school work by mothers there were no significant differences among racial/ ethnic groups. With respect to monitoring by fathers, however, Asian American students reported this relatively more often than did other students (table 15).

B. Relational Analysis

The descriptive analysis has shown many differences between Asian American and other students in school experiences, student commitment and aspirations, and family background. The question

now is: are these differences related to differences in achievement?

To answer this question, it is first helpful to conceptualize the interrelationships among the variables selected for the study. The relationships are depicted as follows:



The arrows indicate the direction of the functional relationships. For example, the arrows that link school experience and family background with student performance indicate the "effect" of school and family variables on student performance. Similarly, the arrow between school and family variables indicate that family variables may "affect" school experience. The implication of these relationships is that any observed effects of school experience on student performance may include the effects of family, and thus the analysis needs to sort out such interrelationships.

1. Simple correlation coefficients

In this analysis, the test scores in the 12th grade and the growth rates are criterion variables, and all other variables described

in the preceeding section are predictor variables. The simple correlation coefficients between these two sets of variables are presented in table 16.

As expected, the earlier test scores (i.e. scores at the 10th grade) were highly related to posttest scores and growth rates, indicating that students with high pretest scores tend to have high posttest scores and growth rates. Among the other variables, total credits in high-level mathematics and science, high school program, student's educational aspirations, racial/ethnic and family background showed strong relationships with posttest scores and growth rates. The number of credits earned in high-level mathematics and science, in particular, are highly related to growth rates. Time spent on homework, father's monitoring of school work, total credits earned in the 11th grade, and participation in intellectual extra-class activities also had moderately high and positive relationships with posttest scores and growth rates. Working for pay during high school, days absent from school, and days late for school, however, had relatively weak but negative relationships with achievement scores.

2. Multiple regression coefficients

The simple correlation coefficients discussed above give some indications of the possible predictive power of individual predictor variables. One difficulty in interpreting these results is that all these predictors are intercorrelated, and thus, each individual relationship between a predictor and the

criterion variables may be confounded by the "effects" of other predictor variables. It is unclear from examination of simple correlation coefficients which variables are really important in predicting the criterion. One solution to this problem is to use multiple regression analysis to determine the unique contribution of each predictor after all other predictors are considered. The results of such analysis are shown in table 17.

It can be seen that most of the selected predictor variables are still significantly related to test scores and growth rates after controlling other variables. The regression coefficients for a few variables (such as total credits in the 12th grade, participation in artistic activities, absence from school, and father's monitoring of school work) are not significantly different from zero, indicating that the relationships between these variables and the criterion variables can be explained by other related predictor variables.

The sizes of the standardized regression coefficients also indicate the relative importance of these predictor variables. Number of credits in high-level mathematics courses, for example, had the highest coefficient, and thus was the most important variable in predicting student achievement. The other variables that showed unique relationships with growth rates were number of credits in high-level science courses, and racial/ethnic background.

Another approach for determining the relative importance of predictors is to enter a block of related variables one at a time and observe the effect of each new block of variables on R-square, the proportion of the variance in the criterion variable accounted for by the predictors. In this analysis, growth rates were used as the criterion variables. School experiences were first entered into the regression function, followed by individual commitment and aspirations, and racial and family background variables. The results are shown in the top portion of table 18. The same procedure was then repeated but with a different order of entry for the three sets of variables. Family background was entered first, followed by individual commitment and school experience variables. The results are shown in the bottom portion of the table. From this table, it can be seen that racial/ethnic and family background variables accounted for an additional 4 percent of the variance in verbal skills, 2 percent in mathematics, and 2 percent in science after school experience and individual commitment and aspirations are considered. In contrast, school experences accounted for an additional 7 percent of the variance in verbal skills, 15 percent in mathematics, and 3 percent in science. This finding suggests that school experiences are more critical in determining student achievement than racial/ethnic and family backgroud.

VI. Summary and Discussion

In summary, Asian American students performed fairly well in school. Their average test scores in mathematics and science

are as high as, if not higher than, the scores of white students even though some Asian American students' learning may have been hampered by their lack of proficiency in English.

This high performance seems to reaffirm the value of the traditional American virtues of commitment and hard work. As HS&B data show, Asian American students were comparatively more committed to academic excellence. They took more academic courses, particularly mathematics, science, and foreign language, than other students; they spent more time on school work; they were less likely to be absent from school; and they were less likely to be late for the school. These variables are related to achievement, also supporting the claims by many researchers that time on task and exposure to subject matter or course enrollment are key process variables affecting the progress of school education (Welch et al., 1982; Jones, 1983). In other words, regardless of family background, a student will learn if exposed to the proper courses and if sufficient time is spent in study.

The question might be raised: why are Asian American students more likely to enroll in high-level academic courses in high school than many other students? There is no simple answer to this question. It is possible that Asian American students have higher educational aspirations, possibly as a result of parental expectations and pressures, and set their goals early. This may help them to start to focus on academic school work early, and to

stay in academic programs throughout high school.

The educational picture for Asian American students, however, is not all rosy. The recent immigrants had much lower scores in verbal skills than many other students. The lack of strong verbal skills may hamper their success in many career opportunities such as journalism, law, business, and management. Additional assistance to those students would be helpful. Future efforts should be directed at developing programs to improve the verbal skills of Asian American students in general and of recent immigrants in particular.

One other interesting finding in this study is that while family background is a major factor in student achievement, it is not more important than school experiences in determining student learning. Particularly in the area of mathematics, proper school experiences -- the type of courses taken in school -- account for more unique variance in student cognitive growth than family background. This suggests that regardless of family background, students can excel if they are given or guided to proper school experiences.

Appendix A

Data Base

This analysis used the student questionnaire data and the transcript data of the 1980 sophomore cohort collected by the High School and Beyond study (HS&B). HS&B is a longitudinal study sponsored by the National Center for Education Statistics within the Office of Educational Research and Improvement, the U. S. Department of Education. The study's purpose is to observe the educational and occupational plans and activities of young people as they pass through the American educational system and take on their adult roles. The study should ultimately contribute to an understanding of student development and of the factors that determine individual educational and career outcomes.

The base-year survey was conducted in spring 1980. The study design included a highly stratified national probability sample of over 1,100 high schools with 36 seniors and 36 sophomores per school. (In those schools with fewer than 36 seniors or sophomores , all eligible students were included in the sample.) Cooperation from both schools and students was excellent. Over 30,000 sophomores and 28,000 seniors enrolled in 1,015 public and private high schools across the nation participated in the base-year survey. The response rate for schools was 70 percent (91 percent after replacement of nonresponding schools with similar schools) and for students within participating schools it was 84 percent.

During the base-year survey, students in the sample were administered a questionnaire, tapping information about their school experiences, activities, attitudes, plans, selected background characteristics, and language proficiency. They were also administered a test battery including reading, mathematics, and vocabulary. The sophomore cohort also was given tests on science, writing, and civics.

The first follow-up survey took place in spring 1982. All students selected for the base-year survey had a non-zero probability of retention in the first follow-up survey sample. Each sophomore cohort member still in the same school was retained with certainty; all others were subsampled. The resulting first follow-up survey sample size was 29,737. Of these, a subsample of 18,000 was selected for a study of high school transcripts.

Cognitive tests--the same ones used in the base-year survey-- and questionnaires were administered to out-of-school students (dropouts and early graduates) as well as to those still in school, including those who had transfered to another school. Questionnaires were completed by 28,119 (94.6 percent) of the 29,737 sample members and the test battery by 26,216 (88.2 percent). A total of 15,942 transcripts were obtained for the subsample of 18,000 students (88.8 percent).

The transcript study sample was used in this analysis. Among the 15,942 sample students, 395 were Asian Americans. The remainder consisted of 3,396 Hispanics, 2,248 blacks, 247 American

Indians, 9,472 whites, and 184 others.

Standard Errors and Statistical Significance Testing

The approximate standard error of a percentage (p) in this paper can be obtained by $s.e.(p)=D(p(100-p)/n)^{\frac{1}{2}}$, where n is the sample size and D is a correction factor estimated to be 2.0. To contrast two subpopulation percentages, $d=p_1 - p_2$, the standard error of the difference, s.e.(d), may be approximated by taking the square root of the sum of the squares of the standard errors for p_1 and p_2 ; that is, $s.e.(d) = (s.e.(p_1)^2 + s.e.(p_2)^2)^{\frac{1}{2}}$. The approximation will be conservative because of the exclusion of the covariance term for p_1 and p_2 in the estimation formula.

Group differences cited in the text are statistically significant at the .05 level on the basis of two-tailed t tests unless otherwise noted.

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Table 1.--Average scores on verbal skills, mathematics, and science in the 10th and 12th grade, by racial/ethnic group

Racial/ethnic group	Verbal skills		Mathematics		Science	
	10th	12th	10th	12th	10th	12th
Asian-Pacific American	25.2 (1.48)	29.8 (1.24)	16.6 (.86)	18.8 (.91)	9.2 (.43)	10.8 (.50)
White	27.8 (.24)	32.9 (.23)	15.5 (.18)	17.6 (.19)	10.3 (.08)	11.3 (.08)
Black	14.5 (.38)	19.2 (.42)	6.5 (.31)	8.2 (.33)	5.6 (.16)	6.4 (.16)
Hispanic	15.6 (.51)	20.1 (.45)	7.7 (.30)	9.1 (.30)	6.5 (.14)	7.5 (.15)
American Indian	18.5 (1.46)	23.0 (1.49)	7.8 (1.15)	10.3 (1.24)	7.6 (.68)	8.7 (.68)

NOTES:

1. Verbal skills--vocabulary, reading, and writing tests.
2. Both computational and curriculum specific (e.g., geometry) tests.
3. The maximum possible score on those tests was 57 for verbal skills, 38 for mathematics, and 20 for science.
4. Figures in paretheses are standard errors.

Table 2.--Average test scores of Asian-Pacific American students on verbal skills, mathematics, and science in 10th and 12th grade, by length of residence.

Length of residence	Verbal skills		Mathematics		Science	
	10th	12th	10th	12th	10th	12th
All or almost all life	27.6	32.4	17.2	18.7	10.1	11.3
	(1.92)	(1.61)	(.87)	(.98)	(.61)	(.63)
More than 10 years but not all	30.6	31.6	17.1	17.3	10.2	11.6
	(3.34)	(4.07)	(2.61)	(3.15)	(1.31)	(1.41)
6-10 years	29.7	35.4	16.6	21.3	9.9	11.7
	(2.33)	(2.85)	(2.15)	(1.94)	(.82)	(.74)
1-5 years	16.1	20.6	15.6	18.4	(6.6)	(9.0)
	(2.06)	(2.31)	(1.98)	(2.43)	(.87)	(.84)

NOTES:

1. Verbal skills--vocabulary, reading, and writing tests.
2. Both computational and curriculum specific (e.g., geometry) tests.
3. The maximum possible score on those tests was 57 for verbal skills, 38 for mathematics, and 20 for science.
4. Figures in paretheses are standard errors.

Table 3.--Average percentage of items on the verbal skills, mathematics, and science tests incorrectly answered by sophmore cohert members in 1980 that were correctly answered in 1982, by racial/ethnic group.

Racial/ethnic group	Verbal skills	Mathematics	Science
1. Asian	47 (1.23)	45 (1.52)	43 (1.49)
2. White	48 (.41)	44 (.42)	40 (.39)
3. Black	35 (.52)	30 (.60)	29 (.58)
4. Hispanic	37 (.45)	32 (.55)	34 (.09)
5. American Indian	39 (1.82)	35 (2.33)	36 (2.06)

NOTES:

1. Verbal skills include vocabulary, reading, and writing tests.
2. Mathematics includes both computational and curriculum specific (e.g., geometry) tests.
3. For this analysis omitted items in 1980 were considered as incorrected.
4. Figures in parenthesis are standard errors.

Table 4.-- Average percentage of items incorrectly answered by Asian Students in 1980 that were correctly answered in 1982, by length of residence

Length of residence	Verbal skills	Mathematics	Science
All or almost all	50 (1.56)	45 (2.17)	41 (1.87)
More than 10 years but not all	46 (6.36)	41 (6.91)	45 (7.09)
6-10 years	49 (3.85)	50 (4.76)	45 (3.75)
1-5 years	39 (2.32)	46 (4.46)	41 (2.73)

NOTES:

1. Verbal skills include vocabulary, reading, and writing tests.
2. Mathematics includes both computational and curriculum specific (e.g., geometry) tests.
3. For this analysis omitted items in 1980 were considered as incorrected.
4. Figures in parenthesis are standard errors.

Table 5.--Percentage of students in each type of high school program, by racial/ethnic group

Racial/ethnic group	Self-reported high school program		
	General	Academic	Vocational
Asian-Pacific American	38	47	15
White	46	37	17
Hispanic	46	23	31
Black	38	29	33
American Indian & Alaskas Native	54	23	23

NOTE: Instructions for the computation of standard errors of the percentages are given in Appendix A.

Table 6.--Average number of credits earned in all subjects and in new basics by grade level and racial/ethnic group

Racial/ethnic group	In all subjects	In new basics only				
		Total	Grade level			
			9th	10th	11th	12th
Asian	22.6(.22)	14.7(.19)	3.7(.10)	3.8(.06)	3.9(.09)	3.3(.10)
White	21.9(.13)	13.2(.09)	3.7(.04)	3.6(.03)	3.3(.03)	2.6(.03)
Black	21.1(.19)	11.9(.20)	3.2(.08)	3.2(.06)	3.0(.05)	2.5(.08)
Hispanic	21.7(.15)	11.7(.12)	3.3(.06)	3.2(.07)	2.9(.03)	2.2(.03)
American Indian	21.3(.32)	11.2(.06)	3.0(.18)	3.0(.15)	2.8(.13)	2.4(.30)

NOTES: 1. New basics include English, mathematics, science social studies, foreign language, and computer science as recommended by the National Commission on Excellence in Education.

2. Figures in parentheses are standard errors.

Table 7.--Average number of credits in high-level mathematics and science, by racial/ethnic group

Racial/ethnic group	Mathematics	Science
Asian	1.65 (1.36)	.84 (1.08)
White	1.09 (1.26)	.46 (.84)
Black	.50 (.89)	.23 (.57)
Hispanic	.48 (.93)	.17 (.49)
American Indian	.38 (.84)	.23 (.62)

NOTES: 1. High-level mathematics includes geometry, algebra II, advanced algebra, trigonometry, calculus, statistics, and other advanced mathematics.

2. High-level science includes advanced biology, chemistry, advanced chemistry, physics I, and advanced physics.

3. Figures in parentheses are standard errors.

Table 8.--Percentage of students who took a foreign language during high school by language and racial/ethnic group: class of 1982

Language	Racial/ethnic group				
	Asian-Pacific	White	Black	Hispanic	American Indian
Any language	69	49	37	38	23
Spanish	38	28	25	30	14
French	28	17	11	9	7
German	8	5	1	1	2
Latin	4	4	2	1	1
Italian	0	1	0	0	0
Other	9	1	1	1	2
More than one language	19	6	3	4	2
Sample size	346	7882	1720	2667	185

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 9.--Percentage of students who participated in selected extra-curricular activities, by racial/ethnic group

Extra-curricular activities	Asian-Pacific	White	Black	Hispanic	American Indian
Sport activities:					
Varsity athletic teams	30	34	39	37	28
Other athletic teams	37	40	41	40	47
Artistic activities:					
Debating or drama	9	13	13	12	10
Band or orchestra	13	14	15	13	22
Chorus or dance	15	18	29	12	12
Intellectual activities:					
Honorary club	28	17	13	11	10
School newspaper, yearbook	18	19	14	15	14
Subject-matter clubs	26	20	24	23	19
Student council, government	21	16	19	15	11
Community activities:					
Vocational education clubs	7	22	31	27	34
Community youth organization	10	16	20	17	15
Church youth group activities	27	35	48	35	30
Junior achievement	9	4	13	8	3

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 10.--Percentage of the 1980 sophomores spending 5 or more hours per week on homework, by racial/ethnic group

Racial/ethnic group	Percentage
Asian-Pacific	46
White	29
Black	25
Hispanic	16
American Indian	22

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 11. Percentage of the 1980 sophomores working 15 or more hours per week, by racial/ethnic group

Racial/ethnic group	Percentage
Asian-Pacific	24
White	32
Balck	30
Hispanic	36
Native American	44

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 12.--Percentage of the 1980 sophomores reporting that they were never absent from school or late for school, by racial/ethnic group

Racial/ethnic group	Percentage	
	Never absent	Never late
Asian-Pacific	45	42
White	36	46
Black	37	35
Hispanic	31	39
American Indian	29	34

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 13.--Percentage of students who aspired to various levels of education, by racial/ethnic group

Racial/ethnic group	Level of educaton			
	High school or less	Some college	4-year college	Graduate & professional
Asian-Pacific	13	23	30	35
White	25	33	24	18
Black	26	33	21	20
Hispanic	38	33	16	14
American Indian	36	30	17	17

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 14.--Percentage of students in each category of socioeconomic status (SES), by racial/ethnic group

Racial/ethnic group	SES Low	Middle	High
All students	24	50	25
Asian-Pacific	22	47	32
White	18	52	30
Black	45	44	11
Hispanic	43	46	12
American Indian	36	51	13

NOTES: 1. SES is a composite measure of father's occupation, mother's education, father's education, family income, and household items. It is based on the base-year survey data.

2. Low - the lower quartile; middle - the middle two quartiles; high - the upper quartile

3. Row percentages may not add to 100 percent because of rounding.

4. Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 15.--Percentage of students reporting that their mother and/or father monitored their school work, by racial/ethnic group

Racial/ethnic group	Mother	Father
Asian-Pacific	85	80
White	87	73
Black	87	52
Hispanic	87	66
American Indian	83	62

NOTE: Insructions for the computation of standard errors of the percentages are given in Appendix A.

Table 16.--Correlation coefficients between predictor and criterion variables: all students

Predictor variable	Criterion variable: 12th grade score			Growth rate		
	Verbal	Math	Science	Verbal	Math	Science
10th grade score						
Verbal	.85	.71	.68	.61	.53	.27
Math	.70	.83	.64	.54	.60	.27
Science	.67	.65	.73	.50	.50	.22
School experiences:						
High school program	.39	.40	.29	.32	.31	.14
Credits in high-level math	.55	.68	.47	.46	.55	.22
Credits in high-level sci.	.42	.53	.41	.38	.47	.21
Total credits in 11th grade	.18	.20	.12	.16	.16	.06
Total credits in 12th grade	.09	.07	.06	.08	.07	.01
Intellectual activities	.29	.27	.19	.24	.22	.10
Artistic activities	.12	.07	.05	.11	.06	.03
Sport activities	.06	.14	.11	.04	.13	.07
Community activities	.00	-.01	-.03	.00	-.01	-.00
Individual commitment & aspirations:						
Time on homework	.29	.30	.19	.24	.23	.09
Time on work for pay	-.09	-.04	.00	-.07	-.01	-.00
Absence from school	-.14	-.17	-.10	-.12	-.13	-.05
Educational aspiration	.46	.48	.35	.37	.37	.16
Late for school	-.07	-.07	-.05	-.05	-.04	-.03
Race/ethnicity: (white, Asian=1; others=0)	.39	.35	.40	.28	.26	.17
Family background:						
Socioeconomic status	.39	.39	.34	.31	.32	.15
Mother monitors sch. work	.08	.07	.06	.06	.04	.02
Father monitors sch. work	.15	.14	.11	.11	.12	.04

NOTES: 1. A coefficient greater than .02 is significant at the .05 level.

2. High school program -- academic program = 1; others = 0.

3. Extra-curricular activities were measured by a simple sum of responses (participation = 1; otherwise = 0) on the related items.

Table 17.--Standardized multiple regression cofficients

Predictor variable	Criterion variable: 12th grade score Verbal	Math	Science	Growth rate Verbal	Math	Science
10th grade score						
Verbal	.64*	.09*	.19*	--	--	--
Math	.09*	.51*	.12*	--	--	--
Science	.07*	.08*	.44*	--	--	--
School experiences:						
High school program	.02*	.00	.01	.07*	.02	.02
Credits in high-level math	.05*	.19*	.04*	.23*	.34*	.11*
Credits in high-level sci.	.00	.07*	.07*	.10*	.20*	.11*
Total credits in 11th grade	.02*	.02*	-.02	.03*	.02*	.00
Total credits in 12th grade	.01	-.02*	.00	.01	-.02	-.02
Intellectual activities	.02*	-.00	-.01	.07*	.02*	.02
Artistic activities	.01*	-.01	-.00	.05*	.01	.01
Sport activities	-.02*	.03*	.02*	-.05*	.04*	.03*
Community activities	.00	.00	-.01	-.03*	-.03*	-.01
Individual commitment & aspirations:						
Time on homework	.03*	.02*	-.01	.03*	.00	-.01
Time on work for pay	-.02*	.01	.02	-.02	.03*	.00
Absence from school	-.00	-.01	-.00	-.02	-.02*	-.00
Educational aspiration	.05*	.03*	.01	.08*	.04*	.01
Late for school	.02*	.02*	.01	.02*	.04*	.00
Race/ethnicity: (white, Asian=1; others=0)	.05*	.04*	.08*	.15*	.13*	.11*
Family background:						
Socioeconomic status	.00	.01	.03*	.09*	.08*	.05*
Father monitors sch. work	.00	.00	-.02*	-.01	.00	-.03*
R-square	.76	.76	.61	.29	.36	.08

NOTES: 1. * significant at the .05 level.

2. High school program -- adacemic program = 1; others = 0.

3. Extra-curricular activities were measured by a simple sum of responses (participation = 1; otherwise = 0) on the related items.

Table 18.--Summary of multiple regression analyses predicting growth rate

Order of variables entered	Verbal R-square	Verbal % added	Mathematics R-square	Mathematics % added	Science R-square	Science % added
School experience	.24	24	.36	36	.06	6
Individual commitment	.25	1	.34	-2	.06	0
Race, family background	.29	4	.36	2	.08	2
Race, family background	.13	13	.13	13	.04	4
Individual commitment	.21	8	.21	8	.05	1
School experience	.29	7	.36	15	.08	3